AMENDMENTS TO THE CLAIMS

Applicants respectfully request that all previous versions of the claims be replaced with the following listing:

1. (Original)   Multiaxis machine tool (2) for producing workpieces having a helicoidal generated surface, which has

a workpiece holder for receiving a workpiece,

a tool,

activatable mechanical axes for machining the workpiece or for positioning the workpiece and the tool in relation to each other, and also

an open-loop and/or closed-loop control device for activating axes,

characterized in that

there is provided at least one virtual axis, which can be parameterized as a guiding axis for other axes and then serves only for the synchronization of these other axes.

2. (Original)   Multiaxis machine tool (2) according to Claim 1, characterized in that at least five activatable mechanical axes are provided for the positioning of the workpiece and the tool in relation to each other.

3. (Original)   Multiaxis machine tool (2) according to Claim 2, characterized in that a grinding wheel is provided as the tool and, as mechanical axes, at least one

positionable radial infeed axis (χ) is provided for the grinding wheel,

a grinding slide (ζ) which can be positioned horizontally and orthogonally in relation to the radial infeed axis is provided for the positioning of the grinding wheel in the direction of displacement of the grinding slide,

a positionable rotating axis (β) of a clamping head is provided for the rotation of the workpiece in the workpiece holder,

a positionable pivoting axis (τ) is provided for the pivoting of the workpiece and the grinding wheel with respect to each other by means of a

rotation of the grinding wheel axis or its parallel projection in the vertical plane (B),

and a rotating axis (ω) is provided for the driving of the grinding wheel.

4. (Original)   Multiaxis machine tool (2) according to Claim 3, characterized in that a positionable displacing axis (δ) for the monitoring of a displacing position of the grinding wheel along the grinding wheel axis is also provided as a mechanical axis.

5. (Currently Amended)   Multiaxis machine tool (2) as claimed in claim 3 [[or 4]], characterized in that a pivoting axis (σ) for the pivoting of the workpiece and the grinding wheel with respect to each other by means of a rotation of the grinding wheel axis or its parallel projection in the horizontal plane (A) is also provided as a mechanical axis.

6. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 3</u> <s>one of Claims 3 to 5</s>, characterized in that a displacing axis (η) for the vertical displacement of the workpiece and the grinding wheel with respect to each other is also provided as a mechanical axis.

7. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 3</u> <s>one of Claims 3 to 6</s>, characterized in that a pivoting axis (γ) for the pivoting of the workpiece and the grinding wheel with respect to each other by means of a rotation of the workpiece axis or its parallel projection in the horizontal plane (A) is also provided as a mechanical axis.

8. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 1</u> <s>one of Claims 1 to 7</s>, characterized in that the virtual axis is formed by the open-loop and/or closed-loop control device by means of a freely selectable function or relation.

9. (Original)   Multiaxis machine tool (2) according to Claim 8, characterized in that the virtual axis is formed by the open-loop and/or closed-loop control device by means of a freely selectable function or relation dependent on time.

10. (Currently Amended)   Multiaxis machine tool (2) according to Claim 8 [[or 9]], characterized in that a polynomial function serves as the freely selectable function.

11. (Currently Amended)   Multiaxis machine tool (2) according to Claim 8 [[or 9]], characterized in that a circular relation serves as the freely selectable relation.

12. (Currently Amended)   Multiaxis machine tool (2) according to Claim 8 [[or 9]], characterized in that a relation given by a table of values serves as the freely selectable relation.

13. (Currently Amended)   Multiaxis machine tool (2) according to Claim 1 ~~one of Claims 1 to 12~~, characterized in that the activation of the respective mechanical axis by the open-loop and/or closed-loop control device takes place by means of a freely selectable function or relation.

14. (Currently Amended)   Multiaxis machine tool (2) according to Claim 8 ~~one of Claims 8 to 13~~, characterized in that the activation of the respective mechanical axis by the open-loop and/or closed-loop control device takes place by means of a freely selectable function or relation which is dependent on the value of one of the virtual axes.

15. (Original)   Multiaxis machine tool (2) according to Claim 14, characterized in that the activation of the respective mechanical axis by the open-loop and/or closed-loop control device takes place by means of a freely selectable function or relation which is also dependent on the value of further parameters.

16. (Original)   Multiaxis machine tool (2) according to Claim 15, characterized in that a polynomial function which is dependent on the value of one of the virtual axes and polynomial coefficients serves as the freely selectable function.

17. (Original)   Multiaxis machine tool (2) according to Claim 15, characterized in that a circular relation which is dependent on the value of one of the virtual axes and circle constants, preferably a circle radius and a centre point, given by a pair of coordinates, and a direction of rotation serves as the freely selectable relation.

18. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 8</u> <s>one of Claims 8 to 17</s>, characterized in that the activation of the respective mechanical axis by the open-loop and/or closed-loop control device takes place by means of a freely selectable relation which is given by a table of coordinates.

19. (Original)   Multiaxis machine tool (2) according to Claim 18, characterized in that an X coordinate, a Y coordinate and a normal angle, preferably as viewed in end-on section, are used as coordinates of the table of coordinates.

20. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 1</u> <s>one of Claims 1 to 19</s>, characterized in that a memory is also provided, stored in which are machine control parameters which are accessed by the open-loop and/or closed-loop control device.

21. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 1</u> <s>one of Claims 1 to 20</s>, characterized in that in the memory in which machine control parameters accessed by the open-loop and/or closed-loop control device are stored there is a data structure which allows the parameterization of the virtual axis as a guiding axis for other axes.

22. (Original)   Multiaxis machine tool (2) according to Claim 21, characterized in that in the memory in which machine control parameters accessed by the open-loop and/or closed-loop control device are stored there is a data structure which also allows the parameterization of any mechanical axis as a guiding axis for other axes.

23. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 1</u> ~~one of Claims 1 to 22~~, characterized in that in the memory in which machine control parameters accessed by the open-loop and/or closed-loop control device are stored there is a data structure which is intended for receiving a definition of the function or relation for the formation of the virtual axis by the open-loop and/or closed-loop control device.

24. (Currently Amended)   Multiaxis machine tool (2) according to <u>Claim 1</u> ~~one of Claims 1 to 23~~, characterized in that in the memory in which machine control parameters accessed by the open-loop and/or closed-loop control device are stored there is a data structure which is intended for receiving a definition of the function or relation for the activation of the respective mechanical axis by the open-loop and/or closed-loop control device.

25. (Original)   Multiaxis machine tool (2) according to Claim 24, characterized in that at least one predefined type of function or relation is provided and the data structure has at least one data field for the identification of the predefined type of function or relation, used for the definition of a function or relation of the respective mechanical axis.

26. (Original)   Multiaxis machine tool (2) according to Claim 25, characterized in that a polynomial function, preferably of the sixth degree, with polynomial coefficients as parameters is predefined as a type of function.

27. (Currently Amended)   Multiaxis machine tool (2) according to Claim 24 [[or 25]], characterized in that a circular relation with a circle radius and a centre point, given by a pair of coordinates, and a rotating direction as parameters is predefined as a type of relation.

28. (Currently Amended)   Multiaxis machine tool (2) according to Claim 24 ~~one of Claims 24 to 27~~, characterized in that a table of coordinates with coordinates as parameters is predefined as a type of relation.

29. (Original)   Multiaxis machine tool (2) according to Claim 28, characterized in that an X coordinate, a Y coordinate and a normal angle, preferably as viewed in end-on section, are used in each case as coordinates.

30. (Currently Amended)   Multiaxis machine tool (2) according to Claim 24 ~~one of Claims 24 to 29~~, characterized in that in the memory in which machine control parameters accessed by the open-loop and/or closed-loop control device are stored there is a data structure which is intended for receiving an identification of the workpiece flank being machined by the activation of the respective mechanical axis by the open-loop and/or closed-loop control device, preferably an identification for a flank on the right or on the left.

31. (Currently Amended)   Multiaxis machine tool (2) according to Claim 24 ~~one of Claims 24 to 30~~, characterized in that in the memory in which machine control parameters accessed by the open-loop and/or closed-loop control device are stored there is a data structure which combines at least one group of machine control parameters corresponding to a partial region of the workpiece, as a segment under a common segment identification, preferably a segment number.

32. (Original)   Multiaxis machine tool (2) according to Claim 31, characterized in that such a group of machine control parameters for which the same axis is parameterized as the guiding axis are always combined as a segment.

33. (Currently Amended)   Method of activating a multiaxis machine tool (2) ~~according to one of Claims 1 to 32,~~ having a workpiece holder for receiving a workpiece, a tool, activatable mechanical axes for machining the workpiece or for positioning the workpiece and the tool in relation to each other, and also an open-loop and/or closed-loop control device for activating axes, comprising:
         providing a virtual axis and initially parameterizing the virtual axis ~~being parameterized~~ as a guiding axis for other axes; and,
         during the operation of the machine for machining the workpiece, synchronizing the other axes ~~merely being synchronized~~ in their positioning with the aid of [[this]] the virtual guiding axis.

34-41. (Cancelled).

42. (Currently Amended)   Multiaxis machine tool (2) according to Claim 1 ~~one of Claims 1 to 32~~, characterized in that it also has a memory and means for reading into the memory machine control parameters for the open-loop and/or closed-loop control device from a data carrier or electronic carrier signal, the data carrier or carrier signal having at least one data structure which has a data field which allows the parameterization of the virtual axis as a guiding axis for other axes, and the data carrier or the electronic carrier signal (3) activates the machine tool (2) during the reading-in or after the reading-in by means of this data structure (3) ~~according to one of Claims 34 to 41 into the memory~~.

43. (Currently Amended)   Method of generating machine control parameters for a multiaxis machine tool having a workpiece holder for receiving a workpiece, a tool, activatable mechanical axes for machining the workpiece or for positioning the workpiece and the tool in relation to each other, and also an open-loop and/or closed-loop control device for activating axes, a memory and means for reading machine control parameters for a open-loop and/or closed-loop control device from a data carrier or an electronic carrier signal ~~according to one of Claims 1 to 32 and 42~~, characterized in that at least one data carrier or an electronic carrier signal (3) is generated with machine control parameters

~~according to one of Claims 34 to 41 is generated.~~ <u>comprising at least one data structure which has a data field which allows the parameterization of the virtual axis as a guiding axis for other axes, and the data carrier or the electronic carrier signal (3) activates the machine tool (2) during the reading-in or after the reading-in by means of this data structure.</u>

44-48. (Cancelled).